Top risk in cyclone not wind, but water

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By Doyle Rice, USA TODAY

Storm surge — the massive mound of water that builds up and comes ashore as a hurricane moves over the ocean or Gulf of Mexico— is the most dangerous aspect of hurricanes, but many public misconceptions persist about it, according to a recent survey of U.S. coastal residents.

"The biggest single killer in hurricanes is storm surge," says Jamie Rhome, storm surge specialist at the National Hurricane Center in Miami. He adds that every coastal city along the Gulf or East Coast of the USA is at risk of storm surge.

"Most U.S. tropical cyclone deaths occur from drowning," says hurricane center deputy director Ed Rappaport. "Storm surge accounted for about half of the losses since 1970. Nearly all of those occurred in Katrina (2005), which was the latest example of an infrequent but catastrophic hurricane storm surge event that kills hundreds or even thousands of people."

Floods from excessive rainfall rank second in causing loss of life in hurricanes. "These floods occur much more often than the storm-surge events, but in general take fewer lives per event," Rappaport says.

The heart of the Atlantic hurricane season is rapidly approaching: Most hurricanes tend to form in August and September, and federal scientists are predicting an above-average season, with as many as 10 hurricanes expected.

That means 30 million Americans living along the Gulf and Southeast coasts are vulnerable to storm surge, says Jeff Lazo, the director of the societal impacts program at the National Center for Atmospheric Research (NCAR) in Boulder, Colo.

NCAR designed, implemented and paid for the survey for a project funded by a grant from the National Oceanic and Atmospheric Administration, interviewing more than 1,200 people in 155 coastal counties in eight states from Texas to North Carolina last November. The counties selected had some degree of storm-surge risk from hurricanes as strong as Category 5 .

"A significant number of people don't know their own vulnerability in the event of a major hurricane," says Lazo about the survey findings.

A "major" hurricane is one that is a Category 3, 4 or 5 on the Saffir-Simpson Hurricane

Scale, with wind speeds greater than 110 mph.

Specifically, he found that 40% of the respondents said they're not likely to get storm surge damage from a major hurricane, when in fact they do live in a storm-surge-prone area.

Also, 34% believed that wind was more likely to cause loss of life than storm surge, and 31% thought that hurricane-spawned tornadoes were more of a threat to life from hurricanes than storm surge.

The survey also found that about 17% of the respondents confuse storm surge with tsunamis, which are large ocean waves generated by offshore earthquakes and are not related to weather. Additionally, 20% thought that storm surge is just floodwater from heavy rain.

The ferocity of water is daunting: Storm surge water can be as high as 30 feet in a huge hurricane.

But even a foot or two of surge water can knock you right over, says Betty Morrow, an independent consultant and sociologist, retired from Florida International University in Miami.

"We had a huge storm surge with Hurricane Katrina in Mississippi, with 250 people killed," Morrow says, adding that the deaths there were overlooked because of the disaster in New Orleans. "Most people to this day do not know that all those people died in the surge. They just didn't believe it would happen — they didn't leave."

Most of the 1,200 deaths in Hurricane Katrina were caused by storm surge, according to the hurricane center.

The Saffir-Simpson Hurricane Scale categories — which measure only wind speed — are not a good indicator of storm-surge risk. People perceive "a huge difference between a 1 and 2 and 3 or above," Morrow reports. "They consider a 1 or 2 minor and stay home … but a 3 or higher, they'll leave."

With this in mind, the weather service is in the early stages of considering a separate storm surge scale for alerting the public as a hurricane approaches, which would be different from the hurricane watch and warning system it currently employs.

"Storm-surge values used to be in the Saffir-Simpson scale, but they were misleading," Rhome says.

A surge can be highly localized, he says, with the same storm producing more than 20 feet of surge in Texas but only 6 or 7 feet in Florida.

For example, every Category 3 hurricane will

produce a different storm surge, he says.

"We're still evaluating the merits of this idea, working with social scientists to see if such a warning would help communicate the threat," Rhome says.

He says such a scale and separate warning system would still be several years away from implementation.

"We've still got a ways to go, simply because it's such an important change," Rhome says. "If we do go forward, we want to do it correctly."